Tennessee Pollution Prevention Partnership Success Story

Saturn Corporation
Spring Hill Manufacturing Facility
P.O. Box 1500
100 Saturn Parkway
Spring Hill TN 37174
931-489-4839
www.saturn.com

1-800-734-3619
www.tdec.net/dca/tp3

Hazardous Materials Source Reduction

The Member

GM-Saturn's Spring Hill Manufacturing Facility is a highly integrated automotive manufacturing and assembly complex of over seven million square feet. Approximately 6,500 Spring Hill team members are involved in producing spaceframe components and body panels, painting vehicles, machining and assembly of engines and transmissions, vehicle assembly, warehousing for retailer parts, and ancillary activities. The facility produces Saturn ION sedans and coupes and the VUE compact SUV.

The Story

Building on previous pollution prevention efforts, GM-Spring Hill developed and implemented hazardous material management improvements in the Paint Shop:

The metals used to make vehicle bodies are subjected to a "phosphating" system early in the painting process, involving a series of cleaning, rinsing, conditioning, and coating steps to prepare the metal surfaces for final spray painting.

Parts of the system require periodic deep cleaning maintenance, historically using large amounts of a nitric acid-based corrosive cleaner. During the summer production model change-over period, Saturn is substituting a phosphoric acid-based cleaner to eliminate the use of nitric acid, and has altered the cleaning process to use less material.

Nitric acid is listed as an EPA Toxic Chemical under EPCRA Section 313. When neutralized on-site, the nitric acid reacts to form nitrates, another listed EPCRA Section 313 Toxic Chemical. Nitrates in the resulting wastewater were discharged to the City of Columbia Publicly Owned Treatment Works.

Also in the painting process, paint overspray is captured using water, which is subsequently treated with chemicals in a settling room and de-watered to create solid waste paint sludge.

Saturn installed new automated feed systems for two (2) treatment chemicals used in the settling room. Chemicals are fed to the system automatically, based on characteristics of the water.

The Success

Implementing a new phosphating cleaning material required a feasibility investigation performed by the chemical management supplier; hazardous material review and approval through established purchasing procedures; and development of a standard operating procedure for the application. A reduction in usage is possible by feeding the chemical into the system over a longer period of time.

Implementing new automated feed systems involved teamwork by the chemical management supplier and GM-Spring Hill operators. They determined the required equipment, installed it, and completed operator training.

Organizational benefits realized from these efforts include cost savings from reduced purchase, treatment, and disposal expenses (more than $50,000 per year); reduced potential health and safety risks and liabilities; and support of ISO 14001/EMS continual improvement objectives and targets.

The Pollution Prevented

This cleaner substitution initiative reduced the on-site treatment of nitric acid and off-site treatment of nitrates by about 30,000 pounds/year.

The automated feed systems reduced hazardous material usage by more than 80,000 pounds/year.

May 2004